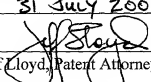


I hereby certify that this paper is being deposited with the United States Postal Service as ~~certified~~ ^{express} mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D. C. 20231

on 31 July 2001


Jeff Lloyd, Patent Attorney

Patent Application
Docket No. KAS-103XC1
Serial No. (not yet assigned)
SUBMISSION OF SEQUENCE
LISTING 37 CFR 1821

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Frederick M. Hahn, Adelheid R. Kuehle
Serial No. : (not yet assigned)
Filed : July 31, 2001
For : Manipulation of Genes of the Mevalonate and Isoprenoid Pathways to Create Novel Traits in Transgenic Organisms

Assistant Commissioner for Patents
Washington D.C. 20231

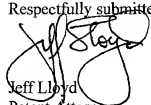
SUBMISSION OF SEQUENCE LISTING UNDER 37 CFR §1.821

Sir:

Transmitted herewith is a sequence listing under 37 CFR §§1.821 through 1.825 for the above-identified patent application.

The sequence is submitted in computer readable format and on paper. I hereby certify that the paper and computer readable copies contain the same sequence information and that no new material is added by this submission.

Respectfully submitted,


Jeff Lloyd
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Registration No. 35,589
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Orlando, FL 32801

JL/stp

Attachments: Sequence Listing on paper and in computer readable format; paperwork for filing Utility Patent Application.

SEQUENCE LISTING

<110> Hahn, Frederick

Kuehnle, Adelheid

<120> Manipulation of genes of the mevalonate and isoprenoid pathways to create novel traits in transgenic organisms

<130> KAS-103XC1

<150> 60/221,703

<151> 2000-07-31

<160> 76

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 tctaaggtta atgtatatgg tgggtgctgt gctctaggtc acccattggg ttgtcttggt 1080
 gctagagtgg ttgttacct gctatccatc ttacagcaag aaggaggtaa gatcggtgtt 1140

gccgccattt gtaattggtg tggtggtgct tctctattg tcattgaaaa gatatga 1197

<210> 21

<211> 1386

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer containing R. capsulatus DNA

<400> 21
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 ggctctgtca tttgtactga cagcgcggtt tatgcagaag gaccgcgaag gccacttgga 480
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acaaccaagg aggggtattat agatcttttg gcaccgggaa cttattatct gaaagaggtt 1320
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 cactga 1386

<210> 22

<211> 1779

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer containing Schizosaccharomyces pombe DNA

<400> 22
 atggatctcc gtcggaggcc tcctaaacca ccggttacca acaacaaca ctccaacgga 60
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 attgctcctc caccgaaagc atccgacgcg ctctctcttc cgttatatct cacaacgcc 180
 gttttcttca cgtctctctt ctccgtcgcg tattacctc tccaccgggt gcgtgacaag 240
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 gcaattgcag ctggacagct tgtgagaagt cacatgaaat acaatagatc cagccgagac 1740
 atctctggag caacgacaac gacaacaaca aacatgat 1779

<210> 23

<211> 684

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer containing *S. pombe* DNA

<400> 23
 atgagttccc aacaagagaa aaaggattat gatgaagaac aattaagggt gatggaagaa 60
 gtttgtatcg ttgtagatga aaatgatgtc ctttaaat atggaacgaa aaaggagtgt 120
 catttcatgg aaaatataaa taaaggctctt ttgcatagag cattctctat gtctcatctt 180
 gatgagcaaa atcgcccttt acttcagcag cgtgcagaag agaaaaattac atttccatcc 240
 ttatggacga atacatgttg ctccacacca ttggatgttg ctggtgaacg tggtataact 300
 ttacctgaag ctgttgaaag gttaagaat gcagctcaac gcaagctgtt ccatgaattg 360
 ggtattcaag ccaagtatat tcccaaagac aaatttcagt ttcttacacg aatccattac 420
 ctgtctccta gtaactgtgc ttggggagag catgaaattg actacattct tttcttcaaa 480
 ggtaaagtgt agctggatat caatcccaat gaagttcaag cctataagta tgttactatg 540
 gaagagttaa aagagatgtt ttccgatcct caatatggat tcacaccatg gttcaaaact 600
 atttgtgagc attttatgtt taaatggttg caggatgtag atcatgcgtc aaaattccaa 660

gataccttaa ttcacgttg ctaa

684

<210> 24

<211> 531

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer containing Streptomyces sp CL190 DNA

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<400> 24
atgagtgagc ttataccgc ctgggttggg gacagactgg ctccggtgga caagttggag      60
gtgcatttga aagggtccg ccacaaggcg gtgtctgttt tcgtcatgga tggcgaaaac      120
gtgctgatcc agcgcgctc ggaggagaaa tatcactctc ccgggctttg ggcgaacacc      180
tgctgcaccc atccgggctg gaccgaacgc cccgaggaat gcgcggtgcg gcggtgctgc      240
gaggagctgg ggatcacgg gctttatccc gcccatgccg accggctgga atatcgcgcc      300
gatgtcggcg gcggcatgat cgagcatgag gtggtcgaca tctatctggc ctatgccaaa      360
ccgcatatgc ggatacccc cgatccgcgc gaagtggccg aggtgcgctg gatcgccett      420
tacgatctgg cgccgaggc cggtcggcat ccgagcgggt tctcgaaatg gctcaacatc      480
tatctgtcga gccatcttga cggattttc ggatcgatcc tgcgcggtcg a              531

```

<210> 25

<211> 65

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer containing Streptomyces sp CL190 DNA

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<400> 25
ggggtagcgc ggccgcacgc gtctatgcac caacctttgc ggtcttgggt tcgcggtcca      60
gctggg

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65

<210> 26

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *S. cerevisiae* DNA

<400> 26
gagctccacc gcggcgccgcg cgctgactac ggccgcagga ggagttcata tgtcagagtt 60

<210> 27

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *S. cerevisiae* DNA

<400> 27
tctaccaaag gaagaggagt tttaactcga gtaggaggca catatgtctc agaacgttta 60

<210> 28

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *Streptomyces* sp CL190 and
R. capsulatus DNA

<400> 28
caagaccgca aaggttggtg catagacgcg gtaaggaggc acatatgagt gagctttatac 60

<210> 29

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *R. capsulatus* DNA

<400> 29
cctgcgccgc tgagcggcgc cggatccgat cgcgtgcggc cgcggtaccc aattcgccct 60

<210> 30

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *Streptomyces* sp CL190
and *S. cerevisiae* DNA

<400> 30
tgtcattgaa aagatatgag gatcctctag gtacttccct ggcggtgca gcggttgacg 60

<210> 31

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *Streptomyces* sp CL190 DNA

<400> 31
cgattccgca ttatcggtag gggtgcctac ctagaactag tggatcccc gggctgcagg 60

<210> 32

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *N. tabacum* and *S. cerevisiae* DNA

<400> 32
ctttcctgaa acataattta taatcagatc ggccgcagga ggagttcata tgtcagagtt 60

<210> 33

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing N. tabacum and R. capsulatus DNA

<400> 33
ttcggatcga tctgcgcgg ctgagcggcc gatctaaaca aaccggaac agaccgttg 60

<210> 34

<211> 59

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing N. tabacum and S. cerevisiae DNA

<400> 34
ctttcctgaa acataattta taatcagatc ggccgcagga ggagttcata tgcagagt 59

<210> 35

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing N. tabacum and S. pombe DNA

<400> 35
tcgttgctaa ggatcccccg ggatccggcc gatctaaaca aaccggaac agaccgttg 60

<210> 36

<211> 13

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing NotI restriction site

<400> 36
catggcggcc gcg

13

<210> 37

<211> 13

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing NotI restriction site

<400> 37
gatccgcggc cgc

13

<210> 38

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *S. cerevisiae* DNA

<400> 38
ttaaataagg aggaataaac catggcggcc gcaggaggag ttcatatgtc agagttgaga

60

<210> 39

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *A. thaliana* DNA

<400> 39

aacaacaaca acatgaccgg g gatccggcc g gatccgag ctgagatct gcagctggta 60

<210> 40

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *S. cerevisiae* DNA

<400> 40
tcgattaaat aaggaggaat aaaccatggc ggccgcagga ggagttcata tgtcagagtt 60

<210> 41

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *R. capsulatus* DNA

<400> 41
gattttcgga tcgatcctgc gggctgagc ggccgcagtc cgagctcgag atctgcagct 60

<210> 42

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *S. cerevisiae* DNA

<400> 42
tcgattaaat aaggaggaat aaaccatggc ggccgcagga ggagttcata tgtcagagtt 60

<210> 43

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *S. pombe* DNA

<400> 43
ttcatcggtg ctaaggatcc cccgggatcc ggccgcgac cgagctcgag atctgcagct 60

<210> 44

<211> 61

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *R. capsulatus* DNA

<400> 44
ttaaataagg aggaataaac catggcggcc gtaaggagcg acatatgagt gagcttatac 60
t 61

<210> 45

<211> 61

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *R. capsulatus* DNA

<400> 45
gcctgcgcgg ctgagcggcg gcggatccga tggccgcgat ccgagctcga gatctgcagc 60
t 61

<210> 46

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *S. pombe* DNA

<400> 46
ttaaataag aggaataaac catggcgcc gtaggagca catatgagtt cccaacaaga 60

<210> 47

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide containing *S. pombe* DNA

<400> 47
accttaattc atcgttgcta aggatccccc ggccgcgac cgagctcgag atctgcagct 60

<210> 48

<211> 1356

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 48
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gccatccctt acggttcatt gcaagggtct gataagtttg aagtcgctgt gaaaagtaaa 180
caatttaaag atggggagtg gctgtacat ataagtccta aaagtggcct cattcctggt 240
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agttttcatt cgcacagaat tgaagaagtt cccaaaacag ggctgggctc ctccggcaggt 480
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gcacaaagat tttctaaggt tcaatggctg gatgtaactc aggcgtgactg ggggtttagg	1320
aaagaaaaag atccggaac ttatcttgat aaataa	1356

<210> 49

<211> 1332

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 49	
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gctgtgtaca acaagcctgc cgtcgctgct agtgtgtctg cgttgagaac ctacctgcta	120
ataagcgagt catctgcacc agatactatt gaattggact tcccgacat tagctttaat	180
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aaaactacca caagcaaca aattgacgat ctattattgc caggaaacac gaattacca	1320
tggacttcat aa	1332

<210> 50

<211> 1191

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 50	
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gggaaaaggg acacgaagtt gaatctgccc accaattcgt ccataatcagt gactttatcg	120
caagatgacc tcagaacggt gacctctgct gctactgcac ctgagtttga acgcgacact	180
ttgtggttaa atggagaacc acacagcatc gacaatgaaa gaactcaaaa ttgtctgcgc	240
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caatggaac tccacattgt ctccgaaaat aactttccta cagcagctgg tttagcttcc	360
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ctattttaaag aaagaattga acatgtcgta ccaaagagat ttgaagtcac gcgtaaaagg	720
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catgccacat gtttggactc tttccctcca atattctaca tgaatgacac ttccaacgct	840
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cagcttgagg ctttcaacca tcaatttgaa tcatctaact ttactgcacg tgaattggat	1080
cttgagttgc aaaaggatgt tgccagagtg attttaactc aagtcgggtc aggccacaa	1140
gaaacaaacg aatctttgat tgacgcaaag actggtctac caaaggaata a	1191

<210> 51

<211> 1197

<212> DNA

<213> *Saccharomyces cerevisiae*

<400> 51	
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tctgccaat tgggccaaag tccggccaga caagttgctt tggctgccgg tttagtaaat	240
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<211> 1386

<212> DNA

<213> Arabidopsis thaliana

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<211> 684

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<213> Artificial Sequence

<220>

<223> Schizosaccharomyces pombe IDI1 (IPP isomerase)

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<212> DNA

<213> Artificial Sequence

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<223> Rhodobacter capsulatus idiB (IPP isomerase)

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<210> 57

<211> 6798

<212> DNA

<213> Artificial Sequence

<220>

<223> Streptomyces sp CL190 gene cluster containing mevalonate pathway
and IPP isomerase orfs

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<212> DNA

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<223> Operon containing A. thaliana and S. cerevisiae DNA

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